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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,937	05/07/2007	Yasuhiro Fukunaka	512.46149X00	9912
20457	7590	07/12/2010	EXAMINER	
ANTONELLI, TERRY, STOUT & KRAUS, LLP			VAN, LUAN V	
1300 NORTH SEVENTEENTH STREET				
SUITE 1800			ART UNIT	PAPER NUMBER
ARLINGTON, VA 22209-3873			1795	
			MAIL DATE	DELIVERY MODE
			07/12/2010	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/576,937	FUKUNAKA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	LUAN V. VAN	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 7/1/10.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 7-10 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 7-10 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1.) Certified copies of the priority documents have been received.  
 2.) Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3.) Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | Paper No(s)/Mail Date. _____ .                                    |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____. | 5) <input type="checkbox"/> Notice of Informal Patent Application |
|  | 6) <input type="checkbox"/> Other: _____ .                        |

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of claims 7-10 in the reply filed on July 1, 2010 is acknowledged. Claims 1-6 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

### ***Claim Status***

Claims 7-10 are pending in the present application.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 7 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Brumlik et al. ("Template Synthesis of Metal Microtubule Ensembles Utilizing Chemical, Electrochemical, and Vacuum Deposition Techniques," Accession Number: ADA274676, published by Defense Technical Information Center, January 11, 1994).

Regarding claim 7, Brumlik et al. teaches a process for manufacturing a metal nanotube comprising: a step of providing a thin metal film having a thickness of 20 nm on one surface of a film having a penetrated hole (page 6, first full paragraph); a step of

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filling an electrolyte solution containing metal ions between the cathode having said thin metal film and an anode and applying a voltage to electrolyze said electrolyte solution (page 6, first full paragraph), thereby electrochemically precipitating metal on the wall surface of said penetrated hole; and a step of immersing the film on which said metal is precipitated in a solvent to remove said film having a penetrated hole, thereby obtaining a metal nanotube (page 7, first full paragraph).

Regarding claim 8, Brumlik et al. teaches wherein said thin metal film comprises gold (page 6, first full paragraph).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brumlik et al. in view of Peng et al. ("Bismuth quantum-wires arrays fabricated by electrodeposition in nanoporous anodic aluminum oxide and its structural properties," Materials Science and Engineering B, Volume 77, Issue 3, 29 September 2000, Pages 246-249) and Tourillon et al. ("ChemInform Abstract: Electrochemically Synthesized Co and Fe Nanowires and Nanotubes," Electrochemical and Solid-State Letters, 3 (1) 20-23, 2000).

Brumlik et al. teaches the method as described above. Brumlik et al. differs from the instant claims in that the reference does not explicitly teach using the specific pH or voltage of the instant claim.

Peng et al. teaches an electrodeposition of Bi nanowires in an anodic aluminum oxide by adjusting the solution to have a pH of 3.0 (page 247).

Tourillon et al. teaches a method of electrochemically depositing Co and Fe nanowires in a nanoporous membrane using an initial overvoltage of -1.5 V followed by a lower potential at -0.8 V (Results and Discussion section).

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the pH of Peng et al. and the voltage of Tourillon et al. in the method of Brumlik et al. in order to form nanotubes having the desired physical properties. Furthermore, it is understood to one having ordinary skill in the art that the pH of the solution and the voltage of the electrodeposition process are result-effective variables that control the properties of the electrodeposit and the rate of electrodeposition. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have optimized the pH and the voltage of Brumlik et al. through routine experimentation to those of the instant claim in order to form nanotubes having the desired physical or mechanical properties.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to the applicant's disclosure. Martin ("Membrane-based Synthesis of Nanomaterials," Chem mater. 1996, 8, 1739-1746) and Bao et al. ("Template Synthesis Of an Array of Nickel Nanotubules and Its Magnetic Behavior," Adv. Mater., 2001, 13, no. 21, November 2, 2001) teach a similar process.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUAN V. VAN whose telephone number is (571)272-8521. The examiner can normally be reached on M-F 9:30-6:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Luan V Van/  
Examiner, Art Unit 1795  
July 7, 2010